SHENG-HO (SEAN) WANG

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SUMMARY OF QUALIFICATIONS

7+ years of professional experience on software engineering, multimedia framework, video container format, video player engine (middleware) design, video codec optimization, algorithm, data structures, multi-threaded programming.

- **Programming languages:** C, C++, Java, Python, JSP, HTML.
- **Video codec standards:** H.264, MPEG1/2/4.
- **Operating systems**: Google TV, Android, Linux, eCos, WinCE, Win32.
- **Video certification**: Divx HD1.3/Plus HD1.2, Android CTS, TV CTS.
- **Products include:** TV, smart phone, feature phone, set-top box, digital album.

EDUCATION

Carnegie Mellon University, Silicon Valley

- M.S. in Electrical and Computer Engineering, Aug. 2014 – Dec. 2015 (expected) • **GPA: 3.86/4.0**

National Taiwan University (Taipei, Taiwan)

- M.S. in Computer Science and Information Engineering, 2005 • **GPA: 4.0/4.0**
- B.S. in Computer Science and Information Engineering, 2003 • **GPA: 4.0/4.0**

EXPERIENCE

Yahoo (Sunnyvale, CA, USA) May 2015 – Present

Media Video Dept., ***Software Engineer Intern***

- Optimized video transcoding performance and system utilization.
- Refactored codebase on FFmpeg command generation and execution.
- Implemented video remuxing for HLS streaming by using FFmpeg libraries.
- Implemented a tool (Python) to analyze bitrate distribution of HLS streaming segments.

Carnegie Mellon University, ***Graduate Student*** Aug. 2014 – Present

- Implemented a distributed video transcoding (Spark) and metadata analysis (Spark-Streaming) service on BDAS framework (sponsored by Ericsson).
- Twitter dataset (1TB) analysis by applying MapReduce and integrating a frontend web server framework (Vert.X) with MySQL/HBase on Amazon EC2.

MStar Semiconductor, Inc. (Taipei, Taiwan) Feb. 2008 – Oct. 2013

R&D Dept., TV Business Group, ***Section Manager*** Oct. 2012 – Oct. 2013

- Led a media player engine team (6 members) to develop Mstar proprietary cross-platform video player engine. Integrated with OpenMax component to replace Android Stagefright player.
- Coordinated project schedule of media player engine integration and new feature implementation, hosted weekly section meeting for issue tracking and code review.
- Lectured on MStar media player framework and engine for MStar-HQ and Mstar-China.

R&D Dept., Mobile Phone Business Group

Principal Multimedia Software Engineer Mar. 2011 – Sep. 2012

Senior Multimedia Software Engineer Feb. 2008 – Feb. 2011

- Designed and implemented media player framework for efficient cross-platform porting, including designing generic plug-in interfaces for all major porting platforms.
- Designed and implemented media player engine, including its multi-thread architecture, software demuxer, subtitle decoder, audio-video sync mechanism, general player functions.
- Enhanced media player engine compatibility and stability, including designing random error patterns, analyzing dynamic video output delay and PCM underflow in auto test.
- Integrated streaming functions (HTTP/RTSP/HLS) with player engine, including designing generic streaming interfaces, implementing a virtual file system for generic I/O control.

• Led the development of the Tudou HTTP/RTSP streaming app on MStar feature phones (www.mstarsemi.com/tw/news.php#64).

BenQ Corporation (Taipei, Taiwan) Aug. 2005 – Mar. 2007
Product R&D Dept., Mobile Phone Business Group, ***Software Engineer***
• Responsible for the video playback and system stability/enhancement on Qualcomm platforms.

National Taiwan University, Dept. of Computer Science and Information Engineering
Graduate Research Assistant • **Advisor Prof. Ja-Ling Wu** Sep. 2003 – Jun. 2005
- Enhanced H.264/AVC encoding performance by jointly optimizing pre-process mechanism and in-loop deblocking filters. (M. S. Thesis, Published in SPIE 2004, EURASIP SIPMCS 2005)
- Utilized SIMD technique to reduce the time complexity of the deblocking module of H.264 software decoder on Trimedia TM1300 media processor. (Published in SPIE 2004)

Undergraduate Research Assistant • **Advisor Prof. Kun-Mao Chao** Sep. 2002 – Jun. 2003
- Devised an evaluation model and a dynamic programming approach for generating optimal single and multiple spaced seeds in sequence alignment. (Published in IEEE BIBE 2004)

PUBLICATIONS

- *H.264/AVC coding performance enhancement via incorporating pre-process with perceptual-based in-loop deblocking filters*, June 2005. M.S. Thesis, advisor: Prof. Ja-Ling Wu.
- S.-H. Wang, S.-W. Wang, Y.-S. Tung, J.-L. Wu, J.-H. Huang, "*Pre-Process for maximizing the effect of in-loop deblocking filtering in H.264/AVC encoding*", 5th EURASIP Conference focused on Speech and Image Processing, Multimedia Communications and Services (EC-SIP-M 2005), Smolenice, Slovak, 29 June - 2 July, 2005.
- S.-H. Wang, S.-W. Wang, Y.-C. Huang, Y.-S. Tung, J.-L. Wu, "*Boundary-energy sensitive visual de-blocking for H.264/AVC coder,*" SPIE Proc. Applications of Digital Image Processing XXVII (SPIE 2004), Denver, CO, August 2004.
- I.-H. Yang, S.-H. Wang, Y.-H. Chen, P.-H. Huang, L. Ye, X. Huang, K.-M. Chao, "*Efficient methods for generating optimal single and multiple spaced seeds,*" IEEE 4th Symposium on Bioinformatics and Bioengineering (BIBE2004), May 2004.

AWARDS & HONORS

- **Carnegie Mellon University chapter of Eta Kappa Nu (HKN)** (*ECE honor society)* • 2015
- **MStar Outstanding Employee Award** (*awarded to top 5% of employees*) • 2008-2012
- **National Taiwan University President's Award** *(top 5% of students)* • 1999, 2003
- **Best Paper Award** in 12th National Taiwan Univ. Engineering Technology Contest • 2003
- **Delta Electronics Inc. Scholarship** *(top 10% of applicants by GPA)* • 2003
- **International Physics Olympiad (IPhO) Short-listed** *(top 8.5% of 3500 students)* • 1998

TECHNICAL SKILLS

- **Expertise in video player framework.**
  - Implemented software video container format demuxer (TS, SSIF, PS, FLV, AVI, MP4).
  - Designed and implemented a thread-safe player engine by ring buffer mechanism.
  - Implemented software subtitle decoder (DVB, PGS).
  - Optimized player performance/code quality, including tuning audio-video sync, optimizing CPU utilization with thread-level profiling, applying code analysis tools (Coverity, Lint).
  - Optimized player engine code size, heap memory usage.
- **Expertise in video codec.**
  - Experience on: H.264, H.263, MPEG1/2/4, JPEG.
  - Optimized H.264 decoding performance on deblocking module by applying SIMD/SSEx.
  - Optimized H.264 encoding performance
    - Pre-process: derived the optimal pixel-based replacement formulas for all H.264 deblocking filters by partial differential equation.
    - Post-process: determined the optimal H.264 deblocking parameters by designing a perceptual-based as well as objective-based measurement.